UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte JAMES LYNN HAAS

Appeal 2006-2300
Application 10/615,746
Technology Center 1700

Decided: September 13, 2007

Before EDWARD C. KIMLIN, PETER F. KRATZ, and
LINDA M. GAUDETTE, *Administrative Patent Judges*.

GAUDETTE, *Administrative Patent Judge*.

DECISION ON APPEAL

This is an appeal from the final rejection of claims 1-13 and 20, the only claims pending in the application. We have jurisdiction under 35 U.S.C. § 6(b).

We AFFIRM.

The invention relates to a fabrication process for producing reinforced polymeric foam composites. Claim 1 is illustrative of the invention and is reproduced below:

1. A process for fabricating a fiber reinforced polymeric foam composite comprising introducing a foamable mixture into a low binder fiber mat and then expanding the foamable mixture into a polymeric foam between top and bottom facing sheets such that the fibers of the low binder fiber mat become dispersed within the polymeric foam, wherein the low binder fiber mat is part of a first composite web that further comprises a support mat and wherein a roll of first composite web is used to supply the process with the first composite web.

The Examiner relies on the following prior art references to show unpatentability:

Londrigan	US 5,837,743	Nov. 17, 1998
Hoffmann	US 4,804,425	Feb. 14, 1989

The Examiner made the following rejection:[1]

Claims 1-13 and 20 under 35 U.S.C. § 103 as unpatentable over Londrigan in view of Hoffmann.

BACKGROUND

The Examiner contends that Londrigan discloses the invention as claimed with the exception of a supply roll of composite comprising a low binder fiber mat and a support web (Answer 5). The Examiner further contends that it would have been obvious to have replaced the two individual supply rolls of low binder fiber mat and support mat in

[1] The rejection of claims 1-13 and 20 under 35 U.S.C. § 103 as unpatentable over Gluck in view of Hoffmann has been withdrawn (Answer 2). The rejection of claims 14-16 under 35 U.S.C. § 103 as unpatentable over Londrigan in view of Hoffmann has also been withdrawn (Answer 3).

Londrigan's process with a single supply roll of composite comprising a low binder fiber mat and a support mat (Answer 5). According to the Examiner, the motivation for this modification is process simplification, i.e., elimination of multiple feed rollers and the need to synchronize feeding speeds of the low binder fiber mat supply and the support mat supply (Answer 6). The Examiner relies on Hoffmann as evidence that one of ordinary skill in the art "could effectively and interchangeably supply a low binder fiber mat and a support mat as a composite on a single feeding roll or separately feed them in different feeding rolls to a foam injection station and a laminating station" (Answer 5-6).

Appellant concedes that Hoffmann discloses forming a composite web comprising a "meshwork web" and facer sheet for use as feeding stock in a foaming process (Br. 5-6). However, Appellant contends that Hoffmann fails to disclose that the meshwork web may be an expandable fiber mat and, more specifically, a low binder fiber mat (Br. 6). Appellant contends that Hoffmann, at best, "suggests a narrow form of composite web consisting of a low binder fiber mat and a facing sheet could be obvious to try – and that is insufficient to make the invention obvious" (Br. 6).

Based on the contentions of the Examiner and the Appellant, the issue before us is: Are the facts and reasons relied on by the Examiner sufficient to establish that one of ordinary skill in the art, upon considering the combined teachings of Londrigan and Hoffmann, would have been motivated to replace the individual supply rolls of low binder fiber mat and support mat in Londrigan's process with a single supply roll of composite comprising a low binder fiber mat and a support mat as claimed? For the reasons discussed below, we answer this question in the affirmative.

RELEVANT FINDINGS OF FACT

1) Londrigan discloses a method for continuous production of a polymeric foam board.

2) According to the method, flexible facing materials are fed from supply rolls, i.e., a roll 30 of lower facing material 31, and a roll 30' of upper facing material 31' (Londrigan, col. 12, ll. 41-44).

3) The flexible facing materials are in the form of continuous or semicontinuous sheets (Londrigan, col. 12, ll. 27-29).

4) Londrigan discloses that a wide variety of materials are employable as the upper and lower facing material. Suitable materials include a steei or aluminum metal sheet, asphalt-saturated felt, an asphalt fiber glass sheet, a fiber glass sheet, paper, paperboard, a metal or plastic foil, and combinations thereof (Londrigan, col. 12, ll. 30-40).

5) In accordance with Londrigan's process, foamable chemicals are dispensed to either lower facing material 31 or upper facing material 31' prior to passing through metering rollers 32 and 33. Metering rollers bring the upper and lower facing materials 31', 30 in surface-to-surface opposition relative to each other, with the foamable mixture sandwiched in between (Londrigan, col. 13, ll. 32-43).

6) Londrigan discloses the use of polyurethane or polyisocyanurate foam-forming mixes (Londrigan, col. 15, ll. 6-8).

7) According to Londrigan, "[a] preferred method for the production of froth foams of the invention is disclosed in U.S. Pat. No. 4,572,865" (Londrigan, col. 9, ll. 29-31).

8) Londrigan discloses that reinforcing web(s) may be introduced above and/or below the foamable chemicals (Londrigan, col. 13, ll. 52-57).

9) The reinforcing web may be fed from a roll 49 toward the nip between the two rotating metering rolls 32 and 33 (Londrigan, col. 14, ll. 1-3).

10) "The nip or gap **47** formed between the rolls **32** and **33** is accurately adjustable so as to insure contact of the foamable mixture with the facing sheets and any reinforcing material and cause the desired uniform distribution of the mixture across the width of the sheets. Rolls **32** and **33** thus serve as a device to meter the amount of chemicals being passed downstream for formation of the desired board thickness" (Londrigan, col. 14, ll. 40-46).

11) According to Londrigan, a preferred reinforcing web material is fiberglass fibers, for example, the type of expandable glass mat used in producing the structural laminate of U.S. Pat. No. 4,028,158, i.e., a thin mat of long, generally straight glass fibers (Londrigan, col. 13, ll. 57-62).

12) Londrigan further states that "[b]y generally following the method of foam reinforcement described in Example 1 of U.S. Pat. No. 4,028,158 and utilizing a foam-forming mixture having the consistency of the liquid foamable mixture of this example, the glass mat becomes distributed within the foam core" (Londrigan, col. 13, ll. 62-67).[2]

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[2] Example 1 of U.S. Pat. No. 4,028,158 discloses the use of a mat of glass fibers which is substantially incompressible and has an overall thickness of 0.030 inches. The glass fibers forming the mat are described as "long, straight fibers having an average diameter of less than 25 microns and lengths varying from 5 to 12 feet with an average length of over 5 feet."

13) Londrigan discloses that more than one fibrous web may be used as reinforcement materials (Londrigan, col. 14, ll. 17-19).

14) In Figure 2, Londrigan discloses the use of three reinforcement webs, an upper material 52 and lower materials 52' and 48 (Londrigan, col. 14, ll. 19-21). The reinforcement materials are fed to the apparatus along with respective adjacent upper and lower facing sheets (Londrigan, col. 14, ll. 37-39). The reinforcement materials may be the same or different types of fibrous webs including an expandable glass mat (Londrigan, col. 14, ll. 23-31).

15) Hoffmann discloses a process and a laminator for the continuous production of laminates of foam with facings wherein "[a]n upper facing and a lower facing and a web of meshwork are introduced into the foaming space of a laminator and a fluid reaction mixture is spread over the lower facing before it runs into the foaming space. The reaction mixture penetrates the web of meshwork as it foams up on its journey through the foaming space and becomes bonded to the facings" (Hoffmann, col. 1, ll. 10-16).

16) In one embodiment, the lower facing comprises a prefabricated composite web of facing and meshwork web (claim 3). The web may be bonded to the facing by adhesive or welding.

17) Hoffmann states that "[i]t is well known to cover the back of facings with non-woven fiber webs or to run them into the foaming

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"Two facing sheets of aluminum foil, each having a thickness of about 0.0015 inches are positioned one on each side of the glass fiber mat and foam-forming mixture" to produce a structural laminate.

space together with reinforcing webs such as glass fiber fabric" (Hoffmann, col. 1, ll. 21-24).

18) According to Hoffmann, a problem with conventional glass fiber fabrics is that they cannot prevent the formation of gas bubbles underneath the upper facing as the foam expands (Hoffmann col. 1, ll. 45-48).

19) Hoffmann solves this problem by using a meshwork web having openings of a particular size (*see* Hoffmann, col. 2, ll. 15-20 and 33-37).

20) Hoffmann discloses that the meshwork web may be made of any of the materials typically used for reinforcing webs, such as glass fibers, metal fibers or wires (Hoffmann, col. 2, ll. 44-47).

21) In one embodiment, Hoffmann discloses the formation of a foam laminated with facings using a composite layer of an aluminum foil and meshwork web (Hoffmann, col. 5, ll. 22-26).

22) The Specification states that "[a] composite web comprises a low binder fiber mat disposed onto a support mat prior to conveying either the low binder fiber mat or the support mat into a fiber reinforced foam fabrication process" (Specification 4:8-10).

23) The Specification states that low binder fiber mats typically comprise multiple fibers held together by some binder "to facilitate handling, but theoretically need not have any binder" (Specification 3:31-4:1).

24) According to the Specification, "[s]uitable fibers include "glass fibers, polymer fibers, ceramic fibers, metal fibers, and organic fibers such as cotton or wool." Most preferably, the fibers are glass fibers. (Specification 3:11-13).

25) According to the Specification, "[e]xamples of non-penetrable support mats include flexile metal sheet (e.g., aluminum foil), paper, paperboard, plastic foils, asphalt-saturated felt, fiberglass sheet" (Specification 5:27-29).

26) According to the Specification, "[e]xamples of penetrable support mats include fiber scrims, netting, and even porous paper or sheet materials" (Specification 5:31-6:2).

27) The Specification states that "[s]uitable examples of foamable mixtures for producing polyurethane and polyisocyanurate foams are in USP 4,572,865" (Specification 8:12-14).

ANALYSIS AND CONCLUSIONS

The Examiner determined that one of ordinary skill in the art would have been motivated to simplify Londrigan's process by replacing individual supply rolls of a low binder fiber mat and a support mat with a single supply roll containing a composite thereof, identifying process simplification as motivation for the modification. The Examiner noted that substitution of a composite supply roll for two separate supply rolls "is an art recognized effective alternative way for supplying a non-woven web and a covering layer into a belt-press foaming laminator as exemplified in the teachings of Hoffman [sic, Hoffmann]" (Answer 5). In our view, the facts and reasons relied on by the Examiner properly establish a prima facie showing of obviousness based on the guidelines set forth in *KSR Int'l Co. v. Teleflex Inc.*, wherein the Supreme Court explained that "[w]here there is a design need or market pressure to solve a problem and there are a finite number of identified, predictable solutions, a person of ordinary skill in the art has good reason to pursue the known options within his or her technical grasp. If this

leads to the anticipated success, it is likely the product ... of ordinary skill and common sense." 127 S. Ct. 1727, 1742, 82 USPQ2d 1385, 1397 (2007).

We do not find Appellant's arguments persuasive in overcoming the Examiner's prima facie showing of obviousness, because they fail to address the facts and reasons relied on by the Examiner in rejecting the claims.

Appellant's arguments focus on his contention that Hoffmann does not utilize a low binder, or any other type of expandable, fiber mat (Br. 7). Thus, Appellant first argues that Hoffmann does not suggest the combination of "a low binder fiber mat and a support mat as a composite web in a single feeding roll (Br. 5). However, it is abundantly clear from the Answer that the Examiner is not relying on Hoffmann for the disclosure of a composite of a low binder fiber mat and support mat (Answer 9). Rather, the Examiner is relying on Hoffmann to show that, in the manufacture of fiber reinforced polymeric foam composites, use of a single supply roll of a composite is a known alternative to multiple supply rolls of the individual materials forming the composite (Answer 9).

Appellant also argues that one of ordinary skill in the art would not have looked to Hoffmann for improvements to Londrigan's process because Hoffmann is not concerned with the problems associated with feeding a low binder fiber mat into a foaming process (Br. 7). This argument likewise fails to address the Examiner's reliance on Hoffmann for a general disclosure of using a single supply roll of a composite in a fabrication process similar to Londrigan's (Answer 9). While the analysis in support of an obviousness determination should "identify a reason that would have prompted a person of ordinary skill in the art to combine the elements," in the manner claimed, *KSR,* 127 S. Ct. at 1731, 82 USPQ2d at 1389, the "analysis [of whether the

subject matter of a claim is obvious] need not seek out precise teachings directed to the specific subject matter of the challenged claim, for a court can take account of the inferences and creative steps that a person of ordinary skill in the art would employ." *Id.,* 127 S. Ct. at 1741, 82 USPQ2d at 1396 (*quoting In re Kahn*, 441 F.3d 977, 988, 78 USPQ2d 1329, 1336 (Fed. Cir. 2006)). *See DyStar Textilfarben GmBH & Co. Deutschland KG v. C.H. Patrick Co.*, 464 F.3d 1356, 1361, 80 USPQ2d 1641, 1645 (Fed. Cir. 2006)("The motivation need not be found in the references sought to be combined, but may be found in any number of sources, including common knowledge, the prior art as a whole, or the nature of the problem itself.") *See also In re Beattie*, 974 F.2d 1309, 1312, 24 USPQ2d 1040, 1042 (Fed. Cir. 1992) ("As long as some motivation or suggestion to combine the references is provided by the prior art taken as a whole, the law does not require that the references be combined for the reasons contemplated by the inventor.").

Appellant presents separate arguments with respect to each of claims 2, 12, 13, and 20. We likewise find these arguments unpersuasive for the reasons well-stated in the Examiner's Answer.

With respect to claim 2, Appellant argues that "there is no indication that fiber uniformity is achieved throughout the foam – or, more particularly, that the fibers become 'substantially distributed' within the foam" (Reply Br. 6). Contrary to Appellant's contention, we find that the Examiner provided a reasonable basis to conclude that the combined teachings of Londrigan and Hoffmann suggest Appellant's claimed process and would result in a low binder expandable fiber mat having fibers substantially distributed within the polymeric foam as claimed (Answer 12). We further note that Londrigan

utilizes the same materials as Appellant for fabrication of a fiber reinforced polymeric foam composite. (*Compare* Findings of Fact 4, 7, 11, and 12 *with* Findings of Fact 23, 24, and 25.) Thus, the burden was properly shifted to Appellant to demonstrate that the Examiner's proposed combination would not result in a low binder expandable fiber mat having fibers substantially distributed within the polymeric foam as claimed. *See In re Best*, 562 F.2d 1252, 1255, 195 USPQ 430, 433-34 (CCPA 1977) (Where patentability rests upon a property of the claimed material not disclosed within the art, the PTO has no reasonable method of determining whether there is, in fact, a patentable difference between the prior art materials and the claimed material. Therefore, where the claimed and prior art products are identical or substantially identical, or are produced by identical or substantially identical processes, the PTO can require an applicant to prove that the prior art products do not necessarily possess the characteristics of the claimed product.) Appellant has not met this burden.

With respect to claims 12 and 13, Appellant argues that Hoffmann only discloses combinations of a meshwork web with a facing sheet (Br. 10). Appellant has not, however, addressed the Examiner's determination that claims 12 and 13 are rendered obvious by Londrigan's Figure 2 embodiment wherein multiple reinforcement materials are positioned between facing sheets (Answer 7 and 12). The reinforcement materials may be adjacent and may comprise different materials including low binder fiber mats (e.g., expandable glass mats) and fibrous webs, the latter of which would appear to meet the limitation of a penetrable support mat (Findings of Fact 13, 14, and 26).

With respect to claim 20, Appellant argues that Hoffmann may not be relied on to show that it would have been obvious to eliminate rollers in Londrigan because Hoffmann is not concerned with low binder fiber mats (Br. 13). As again properly pointed out by the Examiner, Appellant's arguments are unpersuasive because they fail to address the Examiner's explanation of what one of ordinary skill in the art would have understood from the *combined teachings* of the references (Answer 13). "When a patent 'simply arranges old elements with each performing the same function it had been known to perform' and yields no more than one would expect from such an arrangement, the combination is obvious." *KSR,* 127 S. Ct. at 1740, 82 USPQ2d at 1395-96 (*quoting Sakraida v. Ag Pro, Inc.*, 425 U.S. 273, 282, 96 S. Ct. 1532, 1537 (1976)).

In summary, we find that the Examiner has established a prima facie showing of obviousness as to claims 1-13 and 20 which Appellant has failed to rebut.

ORDER

The rejection of claims 1-13 and 20 under 35 U.S.C. § 103 as unpatentable over Londrigan in view of Hoffmann is affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(i)(iv).

AFFIRMED

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